Remarks

The outstanding office action rejects pending claims 1-5, 10 and 12-22 as being anticipated by Roberts. The remaining claims are rejected as being obvious in light of Roberts alone or Roberts in combination with Guenard. The claims have been amended in an effort to better define the invention in a clear and concise manner and to distinguish the Roberts reference. Both the method claim and the apparatus claim have been modified to reference a collimator which is clearly absent from the Roberts patent. In Roberts, the particulate material slides along a series of channel-like troughs formed in the generally frusto conical dispensing chute 15 to fall outwardly from the outer peripheral edge of the dispensing member along a generally parabolic path as illustrated in Figure 1. As noted in the specification, particularly the background section of the present application, different sized particles will flow along a different trajectory. Accordingly, the distance between the particle and the sensor will vary significantly, as well as the distance between the falling particle and the sorting mechanism such as an air jet nozzle making sorting more difficult. The presently claimed invention uses a collimator to cause the falling particles to flow downwardly in mono layer resulting in a relatively constant distance between the detector and the falling particles as well as the sorting mechanism for the falling particles.

Yet another distinction between the claimed invention and the Roberts reference is the shape of the of the dispersion member. The claimed invention calls for a dispersion member having a substantially conical surface which terminates or is bounded by a substantially horizontal peripheral edge. The Roberts reference has a generally conical dispersion member, however, it is a corrugated surface and the lower most edge is sinusoidal and not generally horizontal. The radially extending corrugations in the Roberts dispersion member form little troughs through which particles will flow in a series of individual streams. The present invention by the combination of the peripheral edge and collimator form the creation of a randomized annular, monolayer, concentric, flow of particulate bulk material in order to be able to better sense and sort individual particles.

The following amendments have been made to the language of the claims to distinguish the subjects of the application from that of the cited art (Roberts). We believe that the present invention is directed to a sorting apparatus and method which Roberts in unable to deal with.

Both Roberts and the present invention/application are a method of and apparatus for sorting particulate. Sorting apparatus generally consist of:

1. Infeed and distribution system: Aim of this system is to present the particles to be sorted in a monolayer, to the optical detector and to the corresponding ejector(s).

Roberts: Provides a conical, annular arrangement of channels to create a single file of articles per channel to ensure that each particle maintains its path downwards from feeding through inspecting till ejection. (see Fig 2, Fig 3 and page 1 line 37 to 41) and due to the frusto-conical gravity chute, particles will have both a vertical and horizontal velocity vector. (Roberts page 2 lines 15 to 18) "Articles advancing in each of the channels 17 upon reaching a lower peripheral edge 19 of the dispensing chute 15 wall (assume fall - misprint) freely and successively in arcuate paths.". Hence, particles of different mass will have different trajectories and different velocities creating a multilayer product flow at the detection point.

Present Invention: Conical dispersion plate with horizontal peripheral edge combined with collimator ensure all particles, independent of size and mass, have a vertical trajectory under gravity. (Invention Page 4, Paragraph [0064] line 4 to 9) "The dispersion plate 27 delivers the product evenly in an annular mono-layer to a collimator comprising inner 30 and outer 31 product guides which are nested, coaxial, opposed and frustoconical, to produce, an annular, vertically directed product flow." Hence, as recited in claim 4, a substantially vertical monolayer of product is created which results in all particles having substantially identical speed and distance from the detector.

2. Apparatus throughput efficiency:

Roberts: Utilizes only those sections of the dispersion plate that form chutes feed and distribute particulate. By definition, the diameter at the top of the conical dispersion plate is less than that at the peripheral edge. Thus assuming the channel width remains constant, the wider the conical dispersion plate becomes the more surface of the distribution plate is wasted, (part between the channels) reducing throughput efficiency. (See Fig 2 and Fig3)

Present Invention: The entire dispersion plate is used. The particles are fed and distributed randomly over the entire feed plate maximizing throughput efficiency.

3. Particle Detection Focus:

Roberts: Detector focus is not assured as the aforementioned particulate mass differences create differing trajectories and thus differing distances from the detector focus.

Present Invention: The invention as defined by claim 4 has a conical dispersion plate with horizontal peripheral edge combined with collimator ensure all particles, independent of size and mass, have a vertical, trajectory under gravity. Hence all particles under the influence of only gravity pass at detector focus at the same distance from the detector (present invention claim 9).

4. Inspection System (optical detector):

Roberts: Scanning system only receives and processes light reflected by product in the channels. In between channels there is no active scanning. Roberts uses a mechanical synchronizer to synchronize the detection of particles leaving individual channels (Roberts claim 1 and Fig 6) wherein the scanning means successively scanning individual paths.

Present Invention: The invention of claims 5-12 uses a continuous "actual or effectively rotating source" (Present invention claims 5,6) as it is unknown where individual particles will presented to the detector due to the random feeding system.

5. Reject System:

Roberts: One ejector intrinsically linked to each channel, no rejectors in the space between the channels as no sorting can take place in these areas as no product is presented (Roberts page 11 lines 68 to page 12, line 11 and Claim 2)

Present Invention: The invention of claims 13-16 indicate single or multiple rows of rejectors that can be individually and/or activated in concert to remove accurately unwanted randomly shaped particles that are randomly presented over the entire annulus.

In conclusion, Roberts does not teach towards the above specific integers.

It is respectfully submitted that the entire claim set, as currently amended, is in condition for allowance. If the Examiner has any additional questions or concerns regarding the claims as amended, he is invited to telephone the undersigned so that the matter can be promptly addressed by an Examiner's amendment, if possible.

Please charge the extension of time fees and any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

Troy Blagdon

By /John E. Nemazi/
John E. Nemazi
Reg. No. 30,876
Attorney/Agent for Applicant

Date: May 7, 2008

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351